Operating Instructions

PSG
Plastic Service Group

Single Loop Controller
EC48 & EC96

CE

Table of Contents

1   Introduction

The one zone temperature controller is available as
- controller model EC48 in format 48x48 mm
- controller model EC96 in format 48x96 mm

vor.

Illustration EC48   Illustration EC96

A wide range of applications (hot runners, plastic processing, packaging industry, furnaces and ovens, food processing, dryers, etc.) as well as good price performance ratio characterize this one zone temperature controller.

By the two four-digit seven-segment displays the actual value, setpoint value as well as alarm and status messages are directly readable.

The simple operation by only four keys of the membrane keypad leads the user through clearly structured levels, where the parameters can be individually stipulated.

Not only the power supply of 100 … 240 VAC, 50/60 Hz is for universal use, but also the measurement inputs can be equipped with different types of thermo couples and resistance thermometers configurable in the controller.

According to the equipment implementation the control outputs are of type relay or 24 VDC.

One alarm output (relay type) offers a complete monitoring of the control process (control of a band, of absolute/relative alarm limits, sensor break).

The PID Auto Tuning Function calculates the control parameters (self optimization).

Two and/or three-point operation, manual mode are important functions available for the control zone.

The robust pluggable plastic casing is easy to mount.

1.1   Typographical Conventions

Symbols and conventions are used in this manual for faster orientation for you.

	Caution	With this symbol, references and information are displayed which are decisive for the operation of the device.
		In case of non-compliance with or inaccurate compliance there can result damage to the device or injuries to persons.
	Note	The symbol refers to additional information and declarations, which serve for improved understanding.
	Example	With the symbol, a function is explained by means of an example.
	Reference	With this symbol, information in another document is referred to.
	FAQ	Here FAQ (Frequently Asked Questions) are answered.
	Equations	Calculation specifications and examples are represented in this way.

2   General Information

2.1   Warranty Conditions

This product is subject to the legal warranty time periods for faults or deficiencies in manufacture.

Content of Warranty

If a malfunction relatively occurs through the manufacture, the supplier repairs or replaces the nonconforming product, according to their own discretion.
The following repairs do not fall under the warranty and are liable to costs:
- Malfunctions after the legal notice periods have expired.
- Malfunctions caused through operating error of the user (if the device is not operated as described in the manual).
- Malfunctions caused through other devices.
- Changes or damage to the device which do not originate from the manufacturer.

If you wish to use services within the framework of this warranty, please refer to the supplier.

2.2   Installation and safety references

Before installation, handling or operation of the device, please read through this operating instructions completely and carefully.

Service and repair

This device is maintenance free.
If the device should indicate a fault, you please contact the manufacturer. Customer repairs are not permissible.

Cleaning

Employ no water or cleaning agents based on water for the cleaning of the device stick-on labels. You can clean the surface of the devices with a mild soap solution.

Storage

If you should not put the device into operation immediately after unpacking, protect it against moisture and coarse dirt.

Personnel

The installation of the device may by carried out by qualified personnel only.

Wiring

The wiring system must be implemented correctly according to the specifications in this operating manual. All feeds and connecting terminals must be dimensioned for the corresponding amperage. Furthermore, all connections are to be carried out according to the valid VDE Specification and/or the respective national specifications.
Ensure in particular that the AC power supply is not connected with the logic output or the low-voltage input.

Overload protection

Secure the power supply of the device and the relay output with a fuse protection or a power circuit-breaker. This protects the printed circuit boards against overcurrent.

Environment

Conducting contamination must not reach the proximity of the device connecting terminals in the control cabinet. In order to achieve suitable ambient air conditions, install an air filter in the air inlet of the control cabinet. If the device should be in a condensing environment (low temperatures), install a thermostat-controlled heating unit in the control cabinet.

3 Equipment Implementation

3.1 Type designation

The equipment of the device is stipulated with the order. The exact specification can be read off on the type designation plate, which is on the casing.

The following equipment implementations are available:

EC48 HTS with current transformer	Relay output Heating: electronic switching output
EC96 HTS	Relay output Heating: electronic switching output
EC96 HSR	Relay output Heating: relay output/closer
EC96 HTS KSR	Relay output Heating: electronic switching output Relay output Cooling: relay output/closer
EC96 HSR KSR	Relay output Heating: relay output/closer Relay output Cooling: relay output/closer

3.2 Scope of Delivery

- 1 temperature controller EC** (dependent on equipment implementation)
- 1 CD-ROM with data sheet and operating instructions EC48 & EC96

4 Device construction

4.1 Dimensions
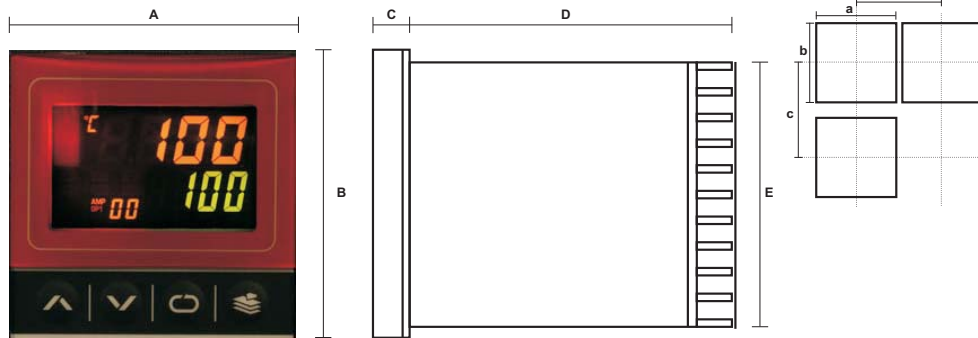
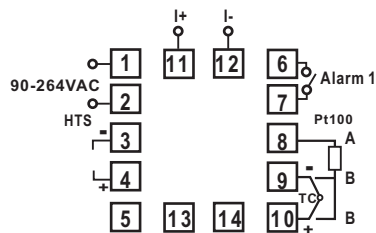|		Controller type EC48	Controller type EC96
A		48	48
B		48	96
C		8	8
D		91.2	91.5
E		45	90
a		45+0.5	45+0.5
b		45+0.5	93+0.5
c		72	120
d		60	60

All specifications in mm.

4.2 Connection overview

The connection overview here indicates all possible connection variants.
The actual connection overview depends on the Equipment Implementation (see chapter 3.1), which is stipulated with the order.

Controller type EC48   **Controller type EC96**
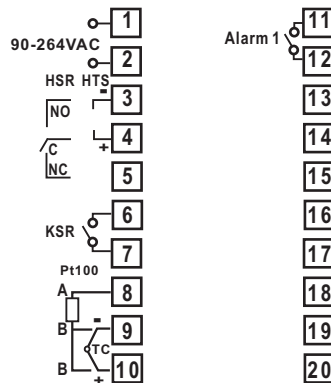
HSR	Relay output Heating: relay output/closer
KSR	Relay output Cooling: relay output/closer
HTS	Relay output Heating: electronic switching output
TC	Thermocouple TC
Pt100	Resistance thermometer Pt100
I+/I-	Heating current recording

5   Installation/Dismantling

Unpacking

The device is packed fully-mounted in a robust carton.
Check the packaging and then the device for identifiable damage incurred during transit. If damage is identified, then please get in touch with the transportation company.

In the case of damage the device may not be brought into operation.

Ensuring voltage-free state

Before beginning and during all installation/dismantling work, attention is to be paid that the system, as well as the devices, are de-energized

Installation location

A device of the protection type IP20 is to be installed in a closed control cabinet.

Securing

The device has a securing mechanism for installation in a control panel cut out.

Device exchange

Only controllers of similar type may be exchanged. In case of replacement, it is absolutely necessary to adopt the setting adjustments of the replaced controller.

6 Electrical connection and operational startup

> ⚠️ The controller may be installed and put into operation by specialist personnel only.
>
> Before switch-on of the control zones it is to be ensured that the controller is configured for the application. An incorrect configuration can lead to damage to the control section or to injuries to persons.

6.1 Connection type

The device is equipped with screwed terminals. The terminals existing on the device are to be taken from the Type designation

The wiring system is implemented on the screwed terminals with the appropriate cable lugs. Cables with a cross section of 0.5 to 1.5mm^2 can be employed.

6.2 Connector assignment and basic configuration

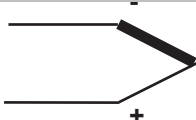The overview here indicates all possible device variants.
The actual assignment depends on the Equipment Implementation (see chapter 3.1), which is stipulated with the order.
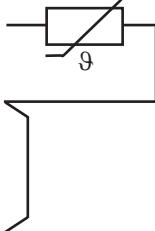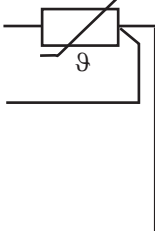
6.2.1 Power Supply

Controller Type	EC48	EC96
Power Supply	230 VAC 50/60 Hz	230 VAC 50/60 Hz
Range	100 … 240 VAC ±10%	100 … 240 VAC ±10%
	o–1 o–2	o–1 o–2
Power consumption	< 5 VA	< 5 VA

6.2.2 Measurement inputs

A thermo couple TC or a resistance thermometer Pt100 can be connected to the measurement input.

Controller Type	EC48	EC96	
Thermocouple TC	9 10	9 10	

| Controller Type	EC48	EC96	
Resistance thermometer Pt100 2-wire	8 9 10	8 9 10	
Resistance thermometer Pt100 3-wire	8 9 10	8 9 10	

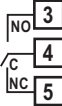#### Configuration on operational startup

Arrange sensor type for the measurement input.	See chapter 9.4 parameter $type$

6.2.3   Control outputs

The control outputs are stipulated by the Equipment Implementation.

Controller Type	EC48	EC96
HTS Relay output Heating: electronic switching output		

Activation of SSR (solid state relay) DC 24 V / 20 mA

Controller Type	EC48	EC96
HSR Relay output Heating: relay output/closer	n.a.	
KSR Relay output Cooling: relay output/closer	n.a.	

Rated output current 5 A
Rated voltage 250 VAC (ohmic load)

6.2.4   Digital outputs

The digital outputs are realized with relay/closer. The device is designed with 1 alarm output.

Controller Type	EC48	EC96
Alarm 1		

Rated output current 5 A
Rated voltage 250 VAC (ohmic load)

Configuration on operational startup

Stipulate alarm output 1	See Chapter9.3

6.2.5   Connection of Current Transformer

The output current can be registered by a current transformer and be used to display the heating current (see chapter 10.4).

Controller Type	EC48	EC96
Connection of Current Transformer		n.a.

7 Status displays/Diagnostics

For special operating conditions of the controller a text instead of the actual value is displayed, to point out a probable error.

Display	Probable Reason	Fault Correction
⊔⊔⊔⊔	▪ Input signal below low limit value	▪ Set a lower value for low limit value
⊓⊓⊓⊓	▪ Input signal above high limit value	▪ Set a higher value for high limit value
– – – –	▪ Sensor break ▪ Sensor not connected	▪ Replace sensor ▪ Check the sensor is connected correctly
▫▫▫▫	▪ Check the sensor connection is not interchanged	▪ Check sensor connection + and –

At start the controller can show in parameter $ErrC$ the following error codes:

Display	Meaning	Fault Correction
0	No error	
1	Memory error	Send controller back to supplier
8	Check the sensor connection is not interchanged	Check sensor connection + and –
16	Sensor break	Replace sensor

See chapter 11.1.

8   Display and Operation
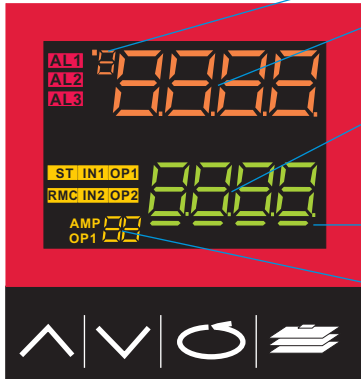
8.1   Display

The overview here indicates all possible device variants.

The actual assignment depends on the Equipment Implementation (see chapter 3.1), which is stipulated with the order.

EC48

AL1	Indicator Alarm 1
AL2	
AL3	
ST	Indicator Auto Tuning
RMC	
IN1	
IN2	
OP1	Output Heating Active
OP2	

Unit
Actual value
Setpoint value
Position indication on value change
Value display (for AMP, OP1 alternatively)

Keys see chapter 8.2.1.

EC96

AL1	Indicator Alarm 1
AL2	
AL3	
ST	Indicator Auto Tuning
HB	
RMC	
IN1	
IN2	
OP1	Output Heating Active
OP2	Output Cooling Active

Actual value
Unit
Setpoint value
Position indication on value change
Value display (for OP1, OP2 alternatively)

Keys see chapter 8.2.1.

8.1.1 Immediately after Switch ON

Immediately after switch ON, all segments of the display are light. That identifies that all displays are intact. The following displays appear

- Parameter `Edtn`   Current controller program version (PSGI)
- Parameter `tYPE`   J (standard configuration) sensor type measurement input
- Parameter `CYt 1`   1 (standard configuration) cycle time Heating
- Parameter `ErrC`   Error status controller (0 = no error; see chapter 7, 9.5)

The display changes to base display.

8.1.2 Base Display

In base display
- the preset unit
- actual value and setpoint value (and/or output percentage in manual mode) in the two four-digit seven-segment LED displays
- display in the two-digit seven-segment LED display alternatively for
  - EC48 - current (AMP) and/or display of output percentage (OP1)
  - EC96 - display of output percentage 1 (OP1) and/or display of output percentage 2 (OP2) (dependent on to equipment implementation)

are shown.

8.1.3 Alternating Display AMP/OP1 (only EC48)

The display down left alternates all 3 seconds between output percentage and heating current.

 Display output percentage for OP1

 Display heating current for AMP

8.1.4 Alternating Display OP1/OP2 (only EC96)

The display down right alternates all 3 seconds between output percentage 1 OP1 and output percentage 2 OP2 (dependent on equipment implementation)

 Display output percentage 1 for OP1

 Display output percentage 2 for OP2

8.2 Operation

The setpoint value can be changed directly in the base display (![setting key symbol]). To change the setting of a parameter, choose first the parameter and/or the adequate operation level and the parameter then.

8.2.1 Keys

The following key symbols are employed:

	Increment key	
	▪ Level mode:	Change to parameter mode
	▪ Parameter mode:	Change to previous parameter
	▪ Setting mode:	Increment setting value

	Decrement key	
	▪ Level mode:	Change to parameter mode
	▪ Parameter mode:	Change to next parameter
	▪ Setting mode:	Decrement setting value

	Setting key	
	▪ Enable setting value	
	▪ Change to previous level	
	▪ Parameter mode:	Enable setting value
	▪ Change and store of setting values	

	Level selection key	
	▪ Change to level mode and selection of a level	
	▪ Parameter mode:	Leave mode
	▪ Setting mode:	Press key, to store data and change to base display
	▪ In all modes:	Keep key pressed for 2 seconds. Change to base display

8.2.2 Function Call by Keys

Auto Tuning Function
Press both keys for at least 2 seconds.
Activate and/or deactivate Auto Tuning Function (see chapter 10.6)

Manual Mode
Press both keys for at least 2 seconds.
Change between manual mode and control mode (automatic) (see chapter 10.2)

Check setting for output percentage!

Soft Start Function
Press both keys for at least 2 seconds.
Activate and/or deactivate Soft Start Function (see chapter 10.5)

Press key for at least 8 seconds
Change to parameter PASS (see chapter 9.5)

Press key for at least 10 seconds
Change to parameter LoCK (see chapter 9.5)

9 Change Controller Settings

9.1 Operation of Parameters

After selection of the adequate operation level, the parameter can be changed as follows.

9.1.1 Change of numeral value

1)	⬭				For selected parameter, press setting key to enter setting mode.
		0000 ↑			Below value display the position indication appears, signalizing by flashing (ones column, see above of ↑, flashing), which position of the number gets changed.
a)			⋀		On the first position from the right, the set value is incremented consecutively, when the key is kept pressed.
					If the entered value for the column exceeds 9, the next column left is incremented (limits of value range are kept).
b)			⋁		On the first position from the right, the set value is decremented consecutively, when the key is kept pressed.
2)	⬭				By pressing the setting key, the position indication can be moved from the right to the left.
		0000 ↑			Tens column (position indication, see above ↑, flashing)
			⋀	⋁	Functioning method see a) and/or b)
		0000 ↑			Hundreds column (position indication, see above ↑, flashing)
			⋀	⋁	Functioning method see a) and/or b)
		0000 ↑			Thousands column (position indication, see above ↑, flashing)
			⋀	⋁	Functioning method see a) and/or b)
	⬭				On thousands column positioned, finish entry.
	≋				Wherever positioned, finish entry.

9.1.2   Select from List of Value

	⬭				For selected parameter, press setting key to enter setting mode.
		⌷⌷⌷⌷ ↑↑↑↑			Below value display all position indications flash (see above of ↑, flashing).
a)			⋀		On the display scroll forwards through the list of value consecutively.
b)			⋁		On the display scroll backwards through the list of value consecutively.
	⬭				Finish entry
	▤				Wherever positioned, finish entry.

9.2 Operation Levels
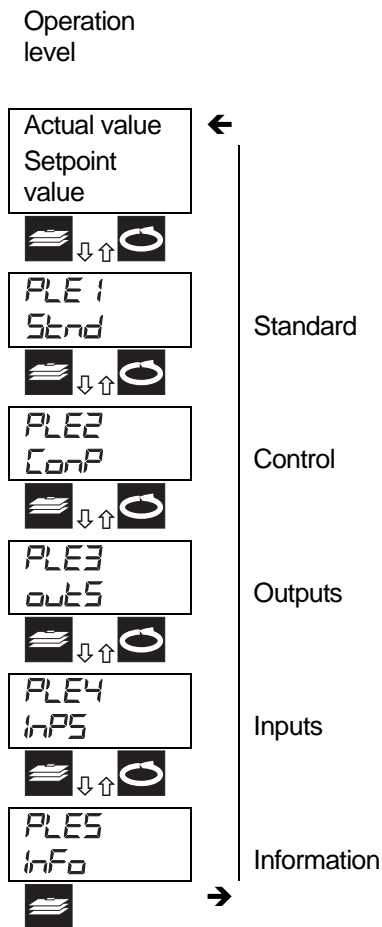
Operation
level

Actual value
Setpoint
value ←

PLE 1
Stnd — Standard

PLE2
ConP — Control

PLE3
out5 — Outputs

PLE4
InP5 — Inputs

PLE5
InFo — Information

→

If there is no operation for at least one minute, the display of the controller returns to base display of actual value/setpoint value.

i	Parameters, that could not be changed, but only be displayed (RO), are displayed in gray. The standard setting is highlighted in green. Parameters, that are changed by the control process, are highlighted orange).

9.2.1   Level 1 – Standard

PLE 1
Stnd

Level 1 Standard

°C LALr
10
← | Actual value alarm △
Value range: -1999…9999°C/°F |

°C ALr 1
10
| Alarm 1 △
Value range: -1999…9999°C/°F |

P oPP 1 (RO)
0
| Output percentage 1
Value range: 0…100% |

P oPP2 (RO)
0
| Output percentage 2*
Value range: 0…100% |

A AMP (RO)
0.0
→ | Current output*
Value range: 0…99 |

*) dependent on equipment implementation see chapter 3.1

9.2.2 Level 2 - Control

Menu	Description
PLE2 ConP ⌄⇩⇧	Level 2 Control
→ Con1 **P id** ⌄⇩⇧⌃	Control mode 1 onF ON/OFF control P id PID control
°C Pb_1 350 ⌄⇩⇧⌃	Proportional band 1 P proportion Value range: 1…600°C/°F
S it_1 30 ⌄⇩⇧⌃	Integral time 1 I proportion Value range: 0…1000sec
S dt_1 200 ⌄⇩⇧⌃	Derivative time 1 D proportion Value range: 0…1000sec
Con2 **P id** ⌄⇩⇧⌃	Control mode 2* nL None onF ON/OFF control P id PID control
°C Pb_2 50 ⌄⇩⇧⌃	Proportional band 2 P proportion Value range: 1…800°C/°F
S it_2 50 ⌄⇩⇧⌃	Integral time 2 I proportion* Value range: 0…200sec
S dt_2 50 ⌄⇩⇧⌃	Derivative time 2 D proportion* Value range: 0…600sec

Menu	Description
↓	
P SFSP 30 ⌄⇩⇧⌃	Soft Start Function – Output percentage Value range: 0…100%
M SFSt 0 ⌄⇩⇧⌃	Soft Start Timer Value range: 0…99min
SELF EurY ⌄⇩⇧⌃	PID Auto Tuning Function no None onE Execute once EurY Execute every time
S CLdY 0 ⌄⇩⇧⌃	Delay time Cooling* #) Value range: 0…600sec
S CLot 0 ⌄⇩⇧⌃	Cooling On time* #) Value range: 0…600sec
P LtP1 100 ⌄⇩⇧⌃	Maximum output percentage 1 Value range: 0…100%
LtP2 100 ⌄⇩⇧⌃	Maximum output percentage 2* Value range: 0…100%
CodL 0 ⌄ ⌃	Without function

#) See Chapter 11.3

*) dependent on equipment implementation see chapter 3.1

9.3 Level 3 – Outputs

	Level 3 – Outputs
PLE3 outS	
oPF1 HEAt ←	Control output 1 HEAt Heating CooL Cooling
sCYt1 1	Cycle time control output 1 Value range: 0…60sec
oPF2 CooL	Control output 2 HEAt Heating CooL Cooling
CYt2 20	Cycle time control output 2 Value range: 0…60sec
ALP1 LoHI	Alarm 1 Mode Value range: see chapter 11.2.1
ASb1 no	Alarm 1 Standby Function YES Active no Deactive
°CAHY1 2	Alarm 1 Hysteresis Value range: 0…500°C/°F
LALP LoHI	Actual value alarm mode Value range: see chapter 11.2.1
PnoPP 0	Output percentage in manual mode Value range: 0…100%
MAuL no →	Manual Mode YES Manual no Auto

9.4 Level 4 – Inputs

PLE4		
InPS		

Level 4 Inputs

→ tYPE	Sensor type for measurement input
J	Value range: see chapter 11.2.2

dECP	Decimal point
0	0
	0.0

unit	Unit
C	C °Celsius
	F °Fahrenheit
	- Not any

ˢdFLt	Digital filter time
0	Value range: 0…60sec

°CLoSt	Lower Set Point Limit
0	Value range: 0…800

°CHISt	Upper Set Point Limit
800	Value range: 0…1000

°CoFSt	Input offset
0	Value range: -999…999°C/°F

Level 4 Inputs

L InL	Linear input low limit
0	Value range: 0…L InH Scale

L InH	Linear input high limit
10	Value range: L InH…20 Scale

dSPL	Display of low limit
0	Value range: -1999…dSPH

dSPH	Display of high limit
100	Value range: dSPH…9999

ALoU	Analog output low limit
0	Value range: 0…200

AHIG	Analog output high limit
200	Value range: 0…250

9.5 Level 5 – Information

PLE5 InFo	Level 5 Information

⌄ ⇩⇧ 📚

Edtn PSGI ←	Program version of controller

⌄ ⇩⇧ ⌃

ErrC 0	Error code 0 no error 1 Memory error 8 Sensor input reverse 16 Sensor break

⌄ ⇩⇧ ⌃

PASS 2	Level activation 2 Display level 1…2 3 Display level 1…3 4 Display level 1…4 5 Display level 1…5 others Display level 1

⌄ ⇩⇧ ⌃

LoCY 188	Data locked
	166 Setpoint value
	        changeable
	168 Setpoint value and level 1
	        changeable
	188 All parameters changeable
	others All parameters locked

⌄ ⇩⇧ ⌃

oPbY no	YES Starts check no Ends check

⌄ ⇩⇧ ⌃

dEFL no	Default value YES All parameters are set to default no No

⌄ ⌃ →

10   Functions

10.1 Set Setpoint Value

The setpoint value can be changed directly in the base display.

Prerequisite   Not any

⬭   Press button

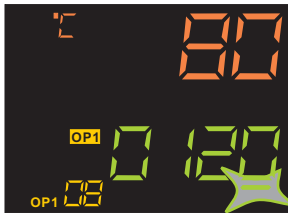   The flashing position indication is shown below the value display.

⋀   On the first position from the right, the set value is incremented consecutively, when the key is kept pressed (limits of value range are kept).

⋁   On the first position from the right, the set value is decremented consecutively, when the key is kept pressed (limits of value range are kept).

          Example: Setpoint value = 120

                               (arrangement of display for EC96 see chapter 8.1)

☰   Finish entry

                               Entry of single positions see chapter 9.1.1 section 2)

If there is no operation for at least one minute, the display of the controller returns to base display of actual value/setpoint value. An already entered value for setpoint value is taken over.

10.2 Activating / Deactivating of Manual Mode

In manual mode the setpoint value instead of output percentage is displayed. As long as the controller is in manual mode, the display of output percentage flashes.
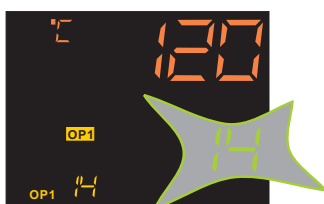The value of output percentage can be changed directly in the base display (see chapter 10.3).

Activating of Manual Mode

Prerequisite	Controller is in control mode.

Press both keys for at least 2 seconds.
Manual Mode is activated.

As soon as the manual mode is activated, the display flashes, to signalize that the output percentage is displayed now and no longer the setpoint value. The current output percentage in parameter $noPP$ is displayed.

(arrangement of display for EC96 see chapter 8.1)
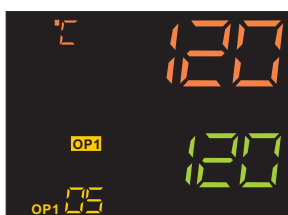
Setting of output percentage see chapter 10.3.

Deactivating of Manual Mode

Prerequisite	Controller is in manual mode.

Press both keys for at least 2 seconds.
Manual Mode is deactivated.

As soon as the control mode is running again, the last set setpoint value is displayed. The display stops flashing to signalize, that now the setpoint value is displayed.

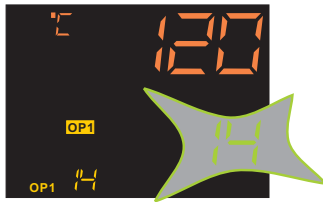(arrangement of display for EC96 see chapter 8.1)

10.3   Set output percentage

The output percentage can be changed directly in the base display. How to change to manual mode, see chapter 10.2.

Set output percentage

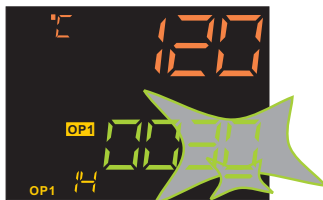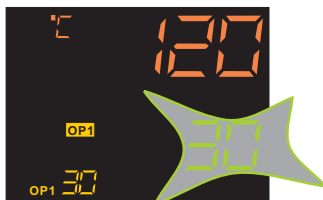| Prerequisite	Controller is in manual mode (see chapter 10.2)
	The display flashes to signalize, that now the output percentage is displayed and not the setpoint value. (arrangement of display for EC96 see chapter 8.1)
	Press button
	The flashing position indication is shown below the value display.
	On the first position from the right, the set value is incremented consecutively, when the key is kept pressed (limits of value range are kept).
	On the first position from the right, the set value is decremented consecutively, when the key is kept pressed (limits of value range are kept).
	Example: output percentage = 30 (arrangement of display for EC96 see chapter 8.1)
	Finish entry
	The new adjusted value (30) is taken for output percentage display as well as display in OP1. (arrangement of display for EC96 see chapter 8.1) Entry of single positions see chapter 9.1.1 section 2)

If there is no operation for at least one minute, the display of the controller returns to base display of actual value/output percentage. An already entered value for output percentage is rejected.

10.4   Display of Heating Current (only EC48)

The output current is measured by a current transformer.
The heating current is displayed as 0...20A

- in the display (without decimal place) next to AMP
- in level 1 (one decimal place) see parameter AMP (see chapter 9.2.1)

are shown.

The heating current is displayed proportional to the output percentage, i.e. at 100% output percentage the maximum heating current is displayed, at 50% output percentage 50% of the maximum heating current is displayed.

Example:

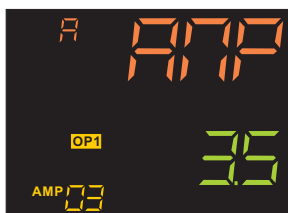For a heating cartridge (1000W/230V) at 100% output percentage a heating current of ~4.35A is displayed;
at 50% output percentage a heating current of ~2.18A.

Prerequisite   Not any
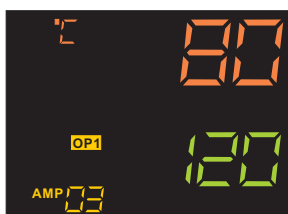
The heating current (example: 3.5A) is displayed in the base display next to AMP without decimal place.

The heating current (example: 3.5 A) is displayed in the operation level in parameter AMP with one decimal place.

10.5 Activating / Deactivating of Soft Start Function

The Soft Start Function is employed for careful warming of zones (baking out the moisture).
When the Soft Start Function is activated, the set value in parameter $SFSP$ is output for the output percentage for the set time in parameter $SFSt$.
The controller returns to control mode, as soon as parameter $SFSt$ = 0 or the actual value > 120°C.

Activate Soft Start Function

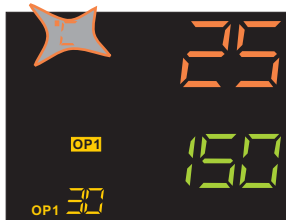|	
Prerequisite	Controller is in control mode
	Parameter $SELF$ = no (see chapter 9.2.1)
	Parameter $SFSP$ ≠ 0 (see chapter 9.2.1)
	Parameter $SFSt$ ≠ 0 (see chapter 9.2.1)
	Actual value < Setpoint value

⬒ **+** ⌄   Press both keys for at least 2 seconds.
Soft Start Function is activated.

To signalize, that the Soft Start Function is running, the unit flashes.
In the display OP1 the output percentage, set for Soft Start Function in parameter $SFSP$ (example: 30 %), is displayed.
The set time in parameter $SFSt$ (example: 1 minute) elapses.
The controller returns to control mode, as soon as parameter $SFSt$ = 0 or the actual value > 120°C.

(arrangement of display for EC96 see chapter 8.1)

When the Soft Start Function reaches the end, parameter $SFSt$ = 0 is set.

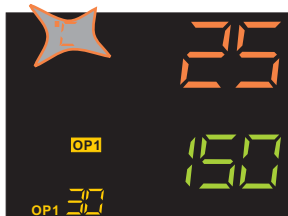The Soft Start Function can not be activated, as long as
- Parameter $SFSt$ = 0
- Parameter $SELF$ ≠ no

For parameter $SELF$ consider settings for PID Auto Tuning Function (see chapter 10.6).

Deactivate Soft Start Function

Prerequisite   The Soft Start Function is running.

                 To signalize, that the Soft Start Function is running, the unit flashes.

                                (arrangement of display for EC96 see chapter 8.1)

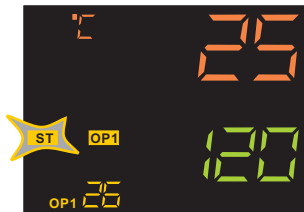   Press both keys for at least 2 seconds.
                                Soft Start Function is deactivated.

                                Is the Soft Start Function deactivated before the normal end, the set value
                                remains in the parameter SFSt.

10.6   PID Auto Tuning Function

By standard setting ($SELF = EurY$) of the controller, the PID parameters Pb_1, It_1, dt_1 are calculated automatically by the Auto Tuning Function after start of the controller, when actual value is 80°C less than setpoint value. While the Auto Tuning Function is running (< 60 seconds), the indicator „ST" flashes in display.

(arrangement of display for EC96 see chapter 8.1)

Manual Start of PID Auto Tuning Function

Prerequisite

Parameter $SELF = EurY$)

Actual value is 80°C less than setpoint value

Controller is running

Press both keys for at least 2 seconds.
Activate Auto Tuning Function

After end of Auto Tuning Function the parameter $SELF$ (see chapter 9.2.1) is set to no .

To have the same starting conditions for the next start of the controller, set parameter $SELF$ to $EurY$ (see chapter 9.2.1).

11 Appendix

11.1 Trouble Shooting

⚠️ Maintenance and repair work may be carried out by authorized persons only. Only skilled and on the risks trained persons may use the device. The relevant accidental regulations as well as other general approved safety-relevant, occupational-medical norms have to be obeyed.

11.1.1 No Display for All Controllers

Reason	Trouble Shooting
Power supply missing	• Check control fuse (rear side of hot runner controller) • Check supply of all phases

11.1.2 No Display for One Controllers

Reason	Trouble Shooting
Controller defective	Exchange 2 controllers against each other and check, whether the error on the alleged defective controller is still remaining. If so, exchange controller.
Wiring error	Exchange 2 controllers against each other and check, whether the error on the alleged defective controller is still remaining. If so, check wiring.

11.1.3 Temperature Does Not Rise

Reason	Trouble Shooting
Fuse of zone defective	Prerequisite: setpoint value > actual value Check, current flow. If not so, check fuse of zone
Heating too low	Prerequisite: setpoint value > actual value Check, current flow. If so, the heating power is too low, i.e. install heating with more heating power.
Allocation of sensor/heating permuted	Check allocation of sensor/heating.
Sensor defective, a too high temperature value is measured	Exchange 2 controllers against each other and check, whether the error on the zone is still remaining. If so, check connecting cable and sensor and exchange defective parts.
Sensor input of controller defective	Exchange 2 controllers against each other and check, whether the error on the alleged defective controller is still remaining. If so, replace controller, otherwise check sensors.

Reason	Trouble Shooting
Wiring error	Prerequisite: setpoint value > actual value Check, current flow. If not so, wiring error possible. Let the wiring of heating be checked by an electrician.

11.1.4 Temperature Too High

Reason	Trouble Shooting
Allocation of sensor/heating permuted	Check allocation of sensor/heating.
SSR defective	Prerequisite: setpoint value < actual value If temperature still rises, check SSR and exchange it.

11.1.5 Temperature Not Stable

Reason	Trouble Shooting
Incorrect PID Auto Tuning or PID Auto Tuning not executed	Let the zones cool down, see 10.6.

11.1.6 Difference in Temperature Display

Reason	Trouble Shooting
Wrong connecting cable	Check of the used thermocouples in the connecting cable. If not FeCuNi Type J, exchange connecting cable.
Incompatible thermocouples	Check of the used thermocouples in the mold. If not FeCuNi Type J, exchange sensor in the mold or contact supplier.
Controller defective	Exchange controller.

11.1.7 Temperature Display ----

Reason	Trouble Shooting
Sensor input of controller defective	Exchange 2 controllers against each other and check, whether the error on the alleged defective controller is still remaining. If so, replace controller, otherwise check sensors.

Sensor break;
Sensor not connected
	Check the connected sensors
	  • Remove connecting cable of hot runner controller
	  • Check sensor input
	If display of ambient temperature, check connecting cable or sensor and exchange them

11.1.8 Temperature Display ⬚⬚⬚⬚

Reason	Trouble Shooting
Check the sensor connection is not interchanged	Check the pin assignment of connecting cable and of mold.

11.2 Value Tables

11.2.1 Alarm Mode Table

Setting		Reaction
LoHI		High and low alarm
HI		High alarm
Lo		Low alarm
r-AS		Absolute alarm
r-LH		High and low alarm INVERTED
r-HI		Low alarm INVERTED
r-Lo		High alarm INVERTED
AbS		Absolute alarm INVERTED
CuLo		Current output low limit
nIL		No Alarm

▼ Setpoint Value

11.2.2 Sensor Types

| Setting	Type	Thermo combination		Range in °C	Range in °F
J	J	Fe-CuNi	Iron|copper-nickel	0…1000	0…1900
K	K	NiCr-NiAl	Nickel-chromium|nickel-aluminum	0…1200	0…2450
t	T	Cu-CuNi	Copper|copper-nickel	0…400	0…730
S	S	Pt10Rh-Pt	Platinum-10% Rhodium|Platinum	0…1700	0…3200
r	R	Pt13Rh-Pt	Platinum-13% Rhodium|Platinum	0…1700	0…3200
E	E	NiCr-CuNi	Nickel-chromium|copper-nickel	0…800	0…1300
dIn	Pt100	ITS		200…600	200…1000
JIS	Pt100	JTS		200…600	200…1000

The standard setting is highlighted in green.

⚠ When another sensor type is used, the compensating cable must be adapted.

11.3 Cooling Output

To protect the cooling output (type KSR) and in case a mechanic relay is connected, before changing between status ON after status OFF, wait a short time.

By the parameter for the minimal OFF time $CLdY$ and the minimal ON time $CLot$ the cooling output can be configured.
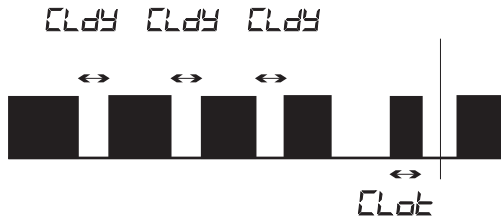
Recommended setting
$CLdY$ = 1
$CLot$ = 1

11.4 Version History

Version	Date	Changes
1.00.00	03-31-2010	First edition PSG Plastic Service GmbH Pirnaer Straße 12-16 68309 Mannheim Germany Tel. +49 621 7162 0 Fax +49 621 7162 162 ww.psg-online.de info@psg-online.de